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INSTRUCTIONS FOR EDUCATIONAL VIDEOS USED IN UNDERGRADUATE CLASSES

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A project submitted to

The School of Food, Hotel & Tourism Management

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School of Food, Hotel and Travel Management
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M.S. Hospitality-Tourism Management
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TABLE OF CONTENTS

Gelatin	3
Separating Eggs	6
Whipping Cream	9
Pie Dough	10-14
Yeast Bread	15-24
Quick Bread	25-32
Knives	33-44
Deep Frying	45-54
Sanitaion	56-65

GELATIN

Gelatin is used to stabilize foams and to thicken liquid based mixtures that will be served cold. Approximately 2 1/2 ounces of any type of gelatin will thicken about 1 gallon of liquid. More gelatin will be required if the liquid contains sugar or acidic ingredients, which inhibit gelling.

METHOD

1. Soak the gelatin in cool liquid before using. This process, called “blooming” allows the gelatin to soften and to begin absorption of the liquid.
2. Melt the dissolved gelatin crystals. This may be done by placing the gelatin-liquid mixture over a warm water bath or by heating it in a microwave oven on a low power setting. If the gelatin is to be combined with a hot liquid, it may be tempered with some or all of that liquid to melt the crystals.
3. Combine the dissolved gelatin with the liquid. Stir well to disperse throughout the mixture. Chill until the mixture is set.

Gelatin powder or sheets are frequently used in a variety of bake shop items. When gelatin is added in the desired amount it can produce light, delicate foams, barbarian creams, mousses, and stabilize whipped cream that are firmly set. Such forms will retain a mold's shape and can be sliced. Gelatin is an animal protein found in bones. It is this protein that causes stock to gel as it cools.

Gelatin salads have a distinguished history. Their ancestors are aspics, the highly ornamented appetizers and elaborate buffet pieces made with meat and fish stocks rich in natural gelatin extracted from bones and connective tissue. Aspics are part of the glory of classical cuisine and still an important part of modern buffet work.

It's no longer necessary to extract gelatin from bones in your kitchen, since purified, granule gelatin and gelatin sheets have long been available for use in the pantry. Many excellent gelatin-based salads can be made with little labor using these products. However, most gelatin products today are made with sweetened prepared mixes, whose high sugar content and heavy reliance on artificial color and flavor make their appropriateness as salads somewhat questionable. Often in a cafeteria line you will see in the salad section little squares of gelatin with a lettuce leaf underneath and a dab of mayonnaise on top; and in the dessert section that identical product, without the lettuce leaf and with a dab of whipped cream in place of the mayonnaise.

Nevertheless, as a professional chef you will have to know how to prepare these products, since your customers will expect them. You should also know how to prepare salads using unflavored gelatin, relying on fruit juices and other ingredients for flavoring. Unflavored gelatin is especially valuable for preparing molded vegetable salads, or terrines since shredded cabbage and other vegetables make a poor combination with a sweetened gelatin powder.

SEPARATING EGGS

Before beginning this procedure you should have available one container for the yolks, one for the clean whites, and a small bowl.

1. Crack open the egg over a small bowl.
2. Transfer the egg back and forth between the halves of the shell, letting the white drop into the small bowl.
3. Place the yolk in its container.
4. Inspect the egg white if there are traces of yolk, reserve it separately for use in omelets, quiches, and other preparations. If the white is clean transfer it to the white's container.

WHIPPING EGG WHITES

In order to obtain the maximum volume from whipped egg whites, all traces of fat must be eliminated because fat, including that contained in the yolks and any grease on the bowl or whip inhibits foaming. Rinse bowls or whips with vinegar to remove grease and then rinse well with hot water. Due to the chemical reaction of the copper and the egg whites, copper bowls tend to increase volume and stability and should be used if available.

1. Begin whipping the egg whites by hand or machine at moderate speed. Tilt the bowl to make whipping by hand easier, resting the bowl on a folded towel to prevent slipping.
2. When the whites are quite foamy, increase the speed.
3. Whip to the appropriate stage.

Soft Peak: When the whisk or beater is pulled up through the egg whites, a droopy, rounded peak will form. At this stage, the surface of the whites look moist and glossy.

Medium Peak: Whites beaded to the medium peak stage have a moist surface and form a rounded but fairly stable peak. At this stage, sugar and other flavoring may be added.

Stiff Peak: When the whisk or beater is lifted out of the egg whites, they will stand up in stiff, stable peaks. It is crucial to stop beating while surface is still moist and glossy.

Over beaten egg whites may still resemble those at the stiff peak stage, but their surface look dry and they have lost their elasticity. If the whites are beaten further, the egg protein will gather into globs and the moisture will weep out.

WHIPPING CREAM

The cream should be cold when it is whipped. Chilling the bowl and beaters in advance also helps in achieving the greatest volume possible. Adding sugar and other flavorings should be added after the cream is whipped to at least a soft peak.

Like egg white, cream can be overbeaten. Overbeaten cream first develops grainy texture, eventually lumps will form and, if whipping continues, the cream will turn to butter.

BASIC PIE DOUGH

Basic pie dough is often called 3-2-1 dough, because it is composed of three parts flour, two parts fat, and one part water by weight. When properly made, the crust is flaky and crisp.

It is important to use pastry flour and to work the dough as little as possible. The larger the fat flakes before the liquid is added, the larger the flakes will be in the baked dough. If the fat is worked more thoroughly into the flour, the result will be a pie crust with a very small flake, this type of dough is sometimes described as mealy.

Fat and liquid should be at the proper temperature this will ensure the correct results. The fat may be shortening, butter or lard. The liquid is customarily water, but milk or cream may also be used. Because of the fat in milk and cream, the amount of fat in the overall formula should be decreased if these ingredients are used. Cream cheese or sour cream may be required in some doughs, which also calls for a fat modification.

A finished dough characteristics may be carried in several ways. Adding sugar will produce a dough known as *saree* that is Swede and darker in color, with a crumbly

texture. Eggs give dough a golden color and a firmer texture. Some dough's flour can be replaced with ground nuts.

MIS EN PLACE

1. Flour: In most cases, a pastry flour will be called for in the recipe. Pastry flour generally contains less protein than all purpose of bread flour, and will result in a more tender product. Since it has a tendency to clump together, pastry flour must be properly sifted.

2. Shortening: This is a very extremely important component of all pastry dough's and cookies. The fat, shortening, butter, or oil used will contribute greatly to both the final texture of the product and its finished flavor. For flaky pastries and cookies, the fat should be cold and plastic.

3. Liquid: Although this may be a small part of the dough for many items, it is nonetheless an important component, since it causes the ingredient to cohere into a homogenous dough. In some cases, the liquid should be very cold to achieve the proper flaky texture in the finished item. It is a good idea in some formulas, notably pie dough's to completely dissolve the salt in the liquid to ensure that it will be evenly distributed throughout the product.

4. Leaveners: A variety of leaveners come into play when preparing pastry dough's and cookies, including physical which is steam, organic could be yeast, and chemical either baking soda or powder.
5. Flavoring Ingredients: Each recipe will indicate any flavoring ingredients that may be required. Nuts, seeds, spices, herbs, cheeses, and a number of other ingredients may be included to produce the desired flavor in the finished product.

METHOD

Scale all of the ingredients and keep the fat as cold as possible. It's a good idea to sift the flour to aerate it and remove any lumps. Cut or break the fat into large lumps, about the size of walnuts. Dissolve the salt in the cold water. This will ensure its even disperse all throughout the dough. Combine the flour and fat. Cut the fat into the dough either by hand, or by using a mixer with a paddle attachment, or with a pastry knife. For flaky pie dough, leave the fat pieces rather large, about the size of nickels or dimes. For mealy pie dough, continue to blend the mixture until it resembles a course meal and has begun to take in a slightly yellow color.

Add the cold water all at once; mix it quickly into the flour and fat mixture. Keeping just until it comes together. Gather the dough into a smooth ball and chill it until it is firm. This allows the dough to relax and also firms up the

fat. Turn the dough onto a floured work surface, lightly dust the dough's surface with additional flour. Using even strokes, roll the dough into the desired thickness and shape. Turn it occasionally to produce an even shape and to keep it from sticking to the work surface. Work from the center towards the edges, rolling in different directions.

Cut the dough, if necessary to fit the pan. Brush away all flour from the surface. The flour could cause the dough to bake unevenly or to burn. Transfer the dough to a pan and fit it gently into the pan's corners. Use a ball of scrap dough to press out any air pockets.

For a fresh fruit pie, add filling, mounding it slightly over the pie rim. Roll out the top crust in the same manner as the bottom crust. Cut slashes in the top crust to allow steam to escape. Use clean hands to firmly pinch away any excess dough with the thumb and forefinger. Seal the edges of the pie so that a slight ridge of dough is formed on the rim of the pie.

Brush the top crust with an egg wash. Be sure that there are no puddles of egg wash. Bake the pie until it is done.

Determining Doneness & Evaluating Quality

As with all baked items, the important characteristics are appearance, texture, and flavor. In general, pie dough's are baked just until they begin to take on a golden color.

The addition of ingredients such as egg yolks, milk, butter, or sugar will take on a richer golden to golden dark brown color. The dough should appear dry. If the dough has been rolled out evenly, the thickness portions may appear moist, indicating that the dough is not fully baked.

The texture will determined the mixing method. If the fat has been worked into the dough completely, the finished crust should have a fine crumb. When the fat is briefly rubbed into the flour the dough will be flaky. If the dough has been under baked, the texture may be gummy or even rubbery. If it has been over baked, the crust may be tough.

The dough's flavor will depend on the type of fat used. Pie dough's made with vegetable shortening will have a nearly neutral flavor. If lard has been used, the dough will taste slightly like the fat. Butter, or a combination of butter and shortening may be used to inhance its flavor.

YEAST BREADS

Yeast breads are divided into two categories: lean and rich dough's. A lean dough can be produced with flour, yeast, and water, which is the formula for a classic French baguette. This dough can be varied by including additional dried nuts and fruits.

A rich dough is produced by the addition of shortening and tenderizing ingredients such as sugars, syrups, butter, oil, whole eggs, egg yolks, milk, or cream. When these fats are introduced, they will change the breads overall texture, as well as the way in which the dough is handled.

Lean dough's contain only small amounts of sugar and fats, if any. Breads made from lean dough tend to have a chewier texture, more bite, and a crisp crust. Hard rolls, French & Italian style breads, whole wheat, rye, and pumpernickel breads are considered lean. By adding a small amounts of any of the enriching ingredients, a very lean dough can be made slightly softer to produce item as dinner rolls or Pullman loaves.

Rich dough's should have a cake like texture after baking. They may be golden in color because of the use of

eggs and butter and the crust usually are very soft, challah, egg rolls, brioche, and clover leaf rolls are all made with rich dough's. The dough's are usually soft and a little more difficult to work with during kneading and shaping than lean dough's.

All baking ingredients must be measured properly a process known as scaling. Unlike home baking which relies on volume measurement. Cups, tablespoons, and teaspoons, in professional baking, ingredients are most often weighed to ensure consistent results.

In general two types of yeast are used in the professional bake shop: dry or granulated and fresh compressed yeast. Yeast is an organic leavener, which means that it must be "alive" in order to be effective. The yeast can be killed by overly high temperatures and conversely cold temperatures can inhibit the yeast action.

Dry yeast, in bulk or packets, should be refrigerated. It will keep for several months, which makes it suitable for kitchens that only occasionally make their own bread. Fresh yeast, on the other hand is quite perishable and can be held under refrigeration for only 7 to 10 days or it may be frozen for longer storage.

Cold yeast should be allowed to return to room temperature before it is used. If there is any doubt about whether or not the yeast is still alive it should be "proofed" before it is added to the other ingredients. Proofing is

achieved by:

1. Combine the yeast with warm liquid with a small amount of flour and sugar.
2. Let the mixture rest at room temperature until a thick surface foam forms.
3. The foam indicates that the yeast is alive and can be used. If there is no foam, the yeast is dead and should be discarded.

A sponge should not be confused with a sour dough starter. A sponge is prepared by combining the yeast and liquid with a portion of the flour and allowing it to ferment until the mixture is light and spongy. When the remaining ingredients are added to the sponge, the yeast is distributed evenly throughout the dough. A sponge is often needed to produce a good texture when using flours such as rye or oat that are low in gluten. Once the sponge is formed the dough is prepared using the straight method.

Mixing the straight dough method is the primary technique used for mixing yeast dough's is the straight dough method. It is applicable to all types of dough's, lean, rich, and sponge type dough's such as rye, and oat.

The traditional sour dough was a simple combination of flour and water that was allowed to stand until the mixture has absorbed wild yeast spores present in the air.

Today, it is more common for some percentage of yeast to be added to a sour dough starter to produce a more uniform and reliable starter. The starter is allowed to ferment until it has soured. Part of this starter is used to prepare a dough. The remaining starter is generally replenished, either by adding flour and water or by returning a portion of the newly made dough to the starter.

The type of wild yeast present in the air differs greatly from region to region. San Francisco is famous for its sourdough breads; the “sour” flavor in sourdough made in other locations may not be as well developed.

MIS EN PLACE

1. Flour: Select the appropriate flour for the type of bread being prepared. Yeast dough's made with low gluten flour such as rye, oat, pumpernickel must include at least some wheat flour, to introduce the necessary gluten for proper rise and texture. Check with the individual recipes. The flour should be carefully scaled for lean dough's, it is generally not important to sift the flour.
2. Liquid: The most frequent choice for lean dough is water. Milk is used for most rich dough's. The liquid should be carefully scaled and at the correct temperature.
3. Yeast: Properly weighed out and let it come to room temperature. If necessary, proof the yeast in warm water

and a small amount of sugar. Some of the flour may also be incorporated to create a sponge, let the mixture ferment until it is light and foamy.

4. Salt: Salt controls the yeast activity and with the exception of sodium-free breads, it is an essential component. It also helps to give bread the correct texture and flavor.

5. Optional Components: These include eggs, butter, oil, sugar, syrups, honey, nuts, seed, spices, or herbs or any other flavor component. Use the eggs at room temperature for best results. Have the butter at room temperature or melted. If melted butter is required by the recipe allow it to cool slightly so that it will not kill the yeast. Flavoring ingredients may be added as indicated by the recipe or as desired.

METHOD

1. Place the warm liquid in the bowl of a mixer that is fitted with a dough hook. Add the yeast and mix it thoroughly. If the sponge method is used or if the yeast should be proofed to test its power, combine the yeast with some liquid, some of the flour and or a small amount of sugar. Cover the bowl and let the yeast ferment in a warm place until it is frothy.

2. Add all the remaining ingredients except the salt to the

yeast mixture. Once all the dry ingredients have been added, add the salt. To prevent the salt from killing the yeast it should be added to the liquid.

3. Mix on low speed until the dough starts to “catch”. It should look like a shaggy mass at this point scrape down the bowl sides and bottom.

4. Increase the mixing speed to medium and continue to knead until the dough develops a smooth appearance and feels that it would spring back when touched. The dough must be properly kneaded. This step ensures full development of the gluten so the dough stretches to “give” as the yeast produces the gas that causes the bread to rise. If the dough is either under or over kneaded it will not rise properly and the finish product will have a coarse texture.

5. Remove the dough to a clean bowl that has been lightly oiled. Rub the dough’s surface with oil to keep it from drying out.

6. Cover the dough with plastic wrap or clean cloths and let it rise in a warm area, away from drafts. Test the dough to determine if it has risen sufficiently by pressing it with a finger. The indentation should not spring back in place. Dough should be allowed to rise sufficiently so that the bread will have the correct texture. Dough that has not risen sufficiently are considered under fermented, and will have a coarse texture and will be flat after it is baked. Dough’s that have risen too much due to over fermented

may have a sour taste, sometimes described as “yeasty” or as tasting like beer.

7. When the dough has risen sufficiently, punch it down in a few places. This will gently expel the carbon dioxide, even out the overall temperature, and redistribute the yeast evenly, then fold the dough over on itself to further expel gases.

8. Remove the dough to a lightly floured work bench.

9. Scale the dough into the appropriate size for rolls, loaves of bread, etc. Then shape it as desired or indicated by recipe and place it in prepared pans.

Properly shaping the dough helps to achieve an attractive appearance, but more important, proper shaping will ensure that the items bake evenly. After shaping many products will need to be “docked”, meaning that the dough’s surface is punctured so that the steam that builds up inside the product during baking will not cause it to split or rupture. The surface may be simply slashed with a sharp knife round loaves may be punctured with a wooden spoon handle.

The first step is to scale the dough into pieces of the appropriate weight. To make baguettes and loaf bread use a flattened fist to pinch the dough into a rectangle of an even thickness. Once the dough is flattened, fold it in half and flatten it once more. Now grasp both ends of the

dough and gently stretch it. Lift the ends up from the cutting board and allow the dough's weight to stretch itself out. Fold the dough in thirds. Begin to roll the dough into a cylinder. Use the heel of the palm to firmly seal the seams as the dough is rolled. The dough is now shaped and ready to be placed in the prepared pan. The dough is allowed to rise once more, this time in a proof box. The dough will rise to more than double its original volume.

Scale the dough into equal pieces. To make hard or club rolls flatten the dough and begin to roll it into cylinder as for loaves. Pinch the seam closed. Be sure that the outer layer is stretched wide enough to encase the roll completely.

For round loaves, gather the dough into a ball and roll it on a worktable to develop a smooth exterior. Gather up the roll from the under side and pinch it to seal the seam. Place it on the pan seam side down.

There are a number of ways to shape dinner rolls. One way is to roll each ball of dough into a rope and then "tie" it into various knots. Parker house rolls are named for the hotel in Boston where they were first served. They are formed by fattening a piece of dough, brushing it with butter, and folding it in half. Clover leaf rolls are made by arranging three small balls of dough in a triangular pattern, clover leaf rolls are often prepared in muffin tins.

The way a pan is prepared depends on the type of

dough being used. To prepare the pan for lean dough's, either line the pan with parchment paper or dust it with cornmeal. The cornmeal is especially appropriate for free form loaves, baguettes, and round loaves. For dough that have a higher percentage of milk, sugar, and fat, the pan should be greased, lined with parchment paper, or greased and lined. For extremely rich dough's like brioche, or challah both greasing and lining are necessary.

Once the dough is in the pan, it must be allowed to rise a second time. This is known as bench proofing. Some dough's will be allowed to rise in a proof box, some are bench proofed in steam to produce the correct texture and crust. The dough should not be allowed to rise too much during bench proofing, as it will continue to rise slightly when it is in the oven. This additional rising is known as oven spring.

The dough should then be baked at the appropriate temperature until it is done. The doneness of baked goods can be determined by examining the item, it should have a good color and the appropriate size. Some products should be baked in steam generating ovens. This is especially important for such items as hard rolls, and French breads, which require very crisp crusts.

Determining Doneness & Evaluating Quality

Yeast dough are allowed to bake until they have a good aroma and golden to brown color; these are the

primary indicators of doneness. Texture and flavor are of course, also important. Thumping the item to see if it has a hollow sound is not always effective. The interior should have a uniform, dry crumb. Yeast raised products should not be cut until they have cooled sufficiently.

Baked yeast raised products should have a golden to deep brown color and a fully developed crust. The use of special flours, such as rye or graham, will influence the color. Dough's that have been brushed with egg wash or milk will have a more tender and golden crust after baking. Dough's that have been brushed with eggs should be golden on the inside. If, after baking a dough has a pale color, it is either not completely baked or has been baked at too low a temperature.

Products made from yeast dough should be fairly elastic but still easy to bite into. The higher the proportion of eggs and shorteners, such as butters or milk, the more tender the finished product will be.

The baked item should not taste strongly of yeast; if it does, it is an indication that the dough was not allowed sufficient time to proof before baking or that too much yeast was used. Dough's that do not include a sufficient amount of salt will have bland flavor.

QUICK BREADS

Quick breads differ from yeast breads in that they use chemical leaveners rather than organic ones and thus do not require a rising period. Quick breads are generally baked or cooked as soon as the dough is mixed.

Many quick breads are at their best served hot from the oven or warm. Nut and fruit loaves, however will have a mellow flavor and be easier to slice if they are baked the day before, if sliced while hot, they may crumble. Others, like doughnuts, are good warm or cold.

Traditionally, quick breads have included a variety of products that may be prepared without the rising or proofing time required by yeast breads.

BASIC METHOD

There are four basic methods for preparing batters, depending on the product being prepared. The straight mix method calls for all ingredients to be combined at once and blended into a batter. The creaming method is used to prepare products with more refined crumb and texture, poured cakes, batter cakes, and most drop cookies.

The “two stage” method is used to prepared cakes that

contain a very high percentage of sugar. The dry ingredients are first blended with all of the shortening and half of the liquid until smooth, then the remaining wet ingredients are gradually added.

The foaming method, which produces the lightest texture is used for genoise, angel food, and chiffon cakes. These methods require careful measuring, proper temperature control, and the proper applications of technique. The following basic techniques and the appropriate formulas will show how the same ingredients combined in different ways can produce different results.

THE STRAIGHT MIX METHOD

The reputation of an establishment's breakfast, brunch, or lunch, menu can be made on the of the quality of its muffins and quick breads. The straight mixing method is used when making such popular items as corn sticks, bran muffins, pumpkin bread, and carrot cake. Once the basic technique is understood, they are simple to produce, and requiring no special equipment.

All ingredients are combined at once in the method and blended into a batter. The important thing to remember is that the batter should not be over worked; unlike yeast dough, these batters should be mixed as briefly as possible to ensure a light, delicate texture.

MIS EN PLACE

Flour: Specific recipes may indicate the use of a number of different flours, unbleached, whole wheat, pastry or cornmeal according to the desired results. The flour should carefully be measured, then properly sifted. It may be necessary to sift all of the dry ingredients together, to allow the ingredients to mix quickly without overworking the batter.

Liquid: Batters rely upon a variety of different ingredients to moisten a batter and hold it together. Milk, buttermilk, water, oil, the moisture from vegetables such as zucchini, and other liquids can all be appropriate, according to the recipe. The liquid should be properly measured, either by weight or by volume, both methods of measure will be accurate.

Leaveners: The leavener for most quick breads and may other batters is a chemical leavened; either baking soda, baking powder, or a combination of the two. Because the leavener is used in very small amounts, it may be appropriate to measure it by volume rather than by weight; using a teaspoon or tablespoon measure may be more accurate than a scale. The leavener should be sifted with the flour, the salt, and any other dry ingredients required by the recipe.

Some batters rely on a physical leaveners, beaten eggs whites to provide the proper texture in the finished item.

The best volume, is a medium peak, is easiest to achieve when the whites are at room temperature before they are beaten. The beaten whites should be folded into the batter immediately in two or three stages, so that the maximum volume is retained, then baked to the correct doneness.

Shortening: The amount of shortening used in a dough will determine its final texture. In some cases it may need to be melted and cooled, for others it should be left cold.

Flavorings: The number and types of flavoring ingredients that can be used in batters is almost limitless some ideas could be cocoa, chopped nuts, grated vegetables, berries, citrus zest, spices, and herbs. Creativity and different variations of recipes will help to compliment each flavor.

METHOD

1. Scale all the dry ingredients and sift them together. All-purpose flour is commonly used for items prepared by this method, although pastry flour may be used for a more tender cake like product. Special flours such as cornmeal, graham flour, or oat flour also may be used.
2. Combine all the liquid ingredients eggs, milk, and fat in a mixing bowl.

3. Add the dry ingredients to the liquid ingredients.
4. Mix the ingredients by hand or in a mixer with a paddle attachment, just until the dry ingredients are moistened. The appearance and consistency of the batters will differ from product to product. Some batters may be thin enough to pour easily, others may be stiff enough to stir. Flavoring ingredients, such as fresh fruit or nuts, should be dusted with flour and then folded gently into the batter once it has been properly mixed. The flour will help suspend the ingredients evenly throughout the batter.
5. Pour the batter into prepared pans by greasing and flouring, or by using paper liners.
6. Bake the batter at the appropriate temperature until it is baked through. When properly done, the items surface should spring back when pressed with a fingertip, a skewer inserted near the center should come out clean, and the item should pull away slightly from the pans edges. Some muffins and quick breads will develop a crack in their upper crust during baking, this usually is not considered a fault.
7. Remove the item from the oven then cool and store it.

Determining Doneness & Evaluating Quality

For all baked goods, the important characteristics are appearance, texture, and flavor. During baking muffins

and quick breads should rise to create a dome shape upper crust. The crust may develop a crack. The edges may become slightly darker than the centers, but they should not shrink too far away from the pan's sides.

The texture should be even throughout the product. Quick breads should be moist but not wet. The flavor should be well developed and appropriate to the ingredients used. The batter must be properly mixed in order to ensure that there are no leavener or flour pockets.

METHODS FOR OTHER BATTER

Although biscuits, scones and soda breads are quick breads, the technique for preparing their batters is different from the straight mix method. They are made from a stiff batter. Almost a dough, which produces a texture slightly chewier than that of the more cake like muffins and breads described previously. The mixing method accounts for the difference.

Instead of combining all the ingredients at once, a fat such as shortening, butter, or lard is rubbed into the flour until the mixture is coarse in texture. This can be done by hand or by using a food processor or mixer. The liquid and flavoring ingredients are then added. As with muffins and quick breads, it is important not to over mix.

In some cases, the batter may be very briefly kneaded

and then rolled out and cut. The dough must not be overworked, as this could cause the finished product to be quite tough.

Once the dough has been mixed and shaped, it may be brushed with an egg wash before being baked, in order to enhance the finished products appearance. Some scones and biscuits may be cooked on a griddle, although most are baked in a oven.

METHODS FOR BISCUITS

1. Work the butter or other shortening into the dry ingredients. The butter or shortening should be cold so that it is still solid enough to be worked into the flour without blending the mixture into a smooth dough. If the shortening is worked into the flour too thoroughly at this point, the end result will not be a flaky and delicate as desired.
2. Once the shortening is properly worked into the flour the mixture should resemble coarse meal, add the blended wet ingredients and mix then together just until they begin to come together. The mixture should not be overworked
3. If necessary, turn the dough out onto a floured work surface and kneed it very briefly.
4. Roll or pat out the dough to an even thickness and cut

it into the appropriate shape. Some biscuits are simple dropped from a spoon onto a baking sheet, requiring no kneading or rolling.

5. Place the biscuits on baking sheets or that have been greased or lined with parchment paper. The closer together the biscuits are placed, the softer and less well developed their crust will be.

6. Bake the biscuits at the appropriate temperature until the tops are evenly browned and there is no appearance of moisture on the sides.

7. Remove the biscuits from the oven and cool and store them.

These products are generally less sweet, and leaner than quick breads. They should have a delicate texture, which may be flaky or cake like, depending on the product being prepared. The crust is often more fully developed than those of quick breads. The flavor is almost impossible to describe except in terms of a specific recipe; for example scones should have a noticeable and pleasant aroma of good quality batter.

KNIVES

The importance of knives to a chef or cook cannot be overstated. The only piece of “equipment” more basic to cooking is the human hand. All knives should be treated with great respect and care. Some important rules:

Keep Knives Sharp: Learn the proper techniques for both sharpening and honing knives. A sharp knife not only performs better but is safer to use, because less pressure is exerted, preventing the possibility of the knife slipping and causing injury.

Keep Knives Clean: Always clean knives thoroughly after using, and sanitize as necessary. So that the tool will not become a site for food cross contamination. Never drop a knife into a full pot sink. It could be dented or nicked by heavy pots, and someone who reaches into the sink could be seriously injured by grabbing the blade. Do not clean knives in a dishwasher, because the handles are likely to warp and split.

Keep Knives Properly Stored: There are a number of safe, practical ways to store knives, including in knife kits or rolls for one’s personal collection, and in slots, racks, and magnetized holders for a shared convenience. Proper

storage will prevent damage to the blade or harm a unwary individual. Knives should be carefully dried after each cleaning, then stored in sheaths to help retain their edge. Always use an appropriate cutting surface, such as cutting boards. Cutting directly on metal, glass, or marble surfaces will dull and eventually damage the blade of a knife.

Always hold a knife by its handle. When passing a knife to someone else, lay it down on a work surface and allow the other person to pick it up. Do not allow the blade of a knife to extend over the edge of a table or cutting board. Refrain from using knives to open bottles, loosen drawers, and so on.

A wide array of knives are available to suit specific functions. As a chef continues to work in kitchens it progress from the basic chef or French knife, boning knife, paring knife, and may also include a number of special knives. Such as a tourne knife, serrated knife, utility knife, or flexible bladed knives.

Selecting a knife of good quality and that fits in the hand and is suitable for the intended tasks depends on a basic knowledge of the various parts of the knife.

BLADES

The metal that a knife blade is made of, is an important consideration. Since the metal must be able to take and hold a very fine edge. Currently, the most

frequently used material for blades is high carbon stainless steel. Other materials, such as stainless steel and carbon steel are also available. For many years, carbon steel was used to make most knife blades. Although carbon stainless steel blades take a better edge, they tend to lose their sharpness quickly, also carbon steel blades will discolor on contact with high acid foods such as tomatoes and onions. Also it discolours some foods such as hard boiled eggs, and may leave a metallic taste. Carbon steel blades must be treated carefully to avoid discoloration, rusting, and pitting. They should be washed and thoroughly dried between uses and before storage. The metal is brittle and can break easily under stress.

Stainless steel is much stronger than carbon steel and will not discolor or rust. It is very difficult to get a good edge on a stainless steel blade. Although once an edge is established, it tends to last longer than that on a carbon steel blade.

High carbon stainless steel is a relatively recent development that combines the advantages of carbon and stainless steel. The high percentage of carbon allows the blade to take and keep a better edge; the fact that it is stainless steel means that it will not discolor or rust readily.

The most desirable type of blade is taper ground. This means that the blade has been forged out of a single metal sheet and has been ground so that it tapers smoothly from the spine to the cutting edge, with no apparent beveling.

Frequently used knives should be made with taper ground blades.

Hollow ground blades are made by combining two sheets of metal; the edges are then beveled or fluted. Although hollow ground blades often have very sharp edges, the blade itself lacks the balance and longevity of a taper ground blade. This type is often found in knives, such as slices, that are used less frequently in the kitchen.

TANGS

The tang is a continuation of the blade that extends into the knives handle. Knives used for heavy work, such as chef's knives or cleavers should have a full tang; that is the tang is as long as the entire handle. A partial tang does not run the length of the handle. Although blades with part tangs, are acceptable for less used knives. Rat tail tangs are much thinner than the spine of the blade and are encased in the handle these are not visible at the top or bottom, these tangs tend not to hold up under extended use.

HANDLES

A preferred material for knife handles is rosewood, because it is extremely hard and has no grain, which helps to prevent splitting and cracking. Impregnating wood with plastic protects the handle from damage caused by continued exposure to water and detergents. Some state

codes require that plastic handles be used in butcher shops because they are considered more sanitary than wood. Care must be taken to thoroughly remove grease because it adheres more closely to plastic than it does to wood.

The handle should fit the hand comfortably, a range of handle sizes are available. People with very small or very large hands should be sure that they are not straining their grip to hold the handle. Some knives are constructed to meet the needs of left handed chef.

RIVETS

Metal fasteners called rivets are used to secure the tang to the handle. The rivets should be completely smooth and be flush with the surface of the handle to prevent irritation to the hand and to avoid a hiding place where microorganisms could gather.

BOLSTERS

In some knives there is a collar or shank known as a bolster. This is at the point where the blade meets the handle. This is a sign if a well made knife, one that will hold up for a long time. Some knives may have a collar that looks like a bolster but is actually a separate piece attached to the handle. These knives tend to come apart easily and should be avoided.

TYPES OF KNIVES

The number of knives that a chef will accumulate over the course of his or her career will almost undoubtedly include a number of special knives and cutting tools.

Chef or French knife: This all purpose knife is used for a variety of chopping, slicing, and cutting chores. The blade is wide at the heel and tapers to a point. The blade is normally eight to fourteen inches long. Larger knives are for heavy chopping, smaller knives are for more delicate work.

Utility Knife: This smaller lighter knife is used for light cutting chores. It is a narrow, pointed five to eight inches long. Used mostly for pantry work, cutting and preparing lettuce, fruits, and so on. Also useful for carving roasts, chicken and duck.

Paring Knife: This short knife, used for paring and trimming vegetables and fruits. The blade is small pointed usually two to four inches long.

Boning Knife: The blade is thin and pointed, about four to six inches long. This knife is used to separate raw meat from the bone, or boning poultry, stiff blades are used for heavier work, flexible blades are used for lighter work.

Filleting Knife: Used for filleting fish. This knife is similar in shape and size to a boning knife, but has a flexible blade.

Slicer: This is used for slicing cooked meats. It has a long slender, flexible blade with a round or pointed tip up to fourteen inches long.

Serrated Slicer: Like a slicer, but with a serrated edge. Used for cutting breads, cakes, and similar items.

Butcher Knife: Heavy, broad slightly curved blade. Used for cutting sectioning and trimming raw meat in a butcher shop.

Scimitar or Steak Knife: Curved, pointed blade. Used for accurate cutting of steaks.

Cleaver: Very heavy blade. Used for chopping and the blade is heavy enough to cut through bones. It has a rectangle blade and varies in size according to its uses.

Tourne Knife: This small knife, similar to a paring knife has a curved blade to make cutting the curved surfaces by turned vegetables easier.

SHARPENING AND HONING TOOLS

The key to the proper and efficient use of any knife is making sure that it is sharp. A knife with a sharp blade always works better and more safely because it cuts easily. Without requiring the chef to exert pressure, which may

cause the knife to slip and cause injury. Knife blades are given an edge on a sharpening stone and maintained between sharpening by honing with a steel.

SHARPENING STONES

Sharpening stones are essential to the proper maintenance of knives and are used to sharpen the blade by passing its edge over the stone at the correct angle.

THE GRIT

The degree of coarseness or fineness of the stones surface abrades the blades edge, creating a sharp cutting edge. When sharpening a knife, always begin by using the coarsest surface of the stone and then move onto the finer surfaces. A stone with a fine grade should be used for boning knives and other tools in which an especially sharp edge is required. Most stones may be used either dry or moistened with water or mineral oil. Once oil has been used on a stones surface the practice should be continued. Three basic types of stones are commonly available.

1. *Carborundum*: stones which have a fine side and a medium side.
2. *Arkansas*: stones are available in several grades of fineness with three stones of varying degree of fineness which is mounted on a wheel.

3. *Diamond*: stones are also available, although they are expensive. Some chefs prefer them because they feel these stones give a sharper edge. The standard size for sharpening stones is 8 by 2 by 13/16 inches.

Before using a stone, the chef should be sure that it is properly stabilized. Place carborundum or diamond stones on a dampened cloth and allow enough room to work. A triple face stone is mounted on a rotating framework that can be locked into position so that it will not move. The blade should be held at a 20 degree angle to the stone's surface and the entire length of the blade should be drawn across the stone.

GUIDELINES FOR USING A STONE

1. Hold the knife firmly. Start with the tip of the knife against the stone and hold the edge against the stone at a 20 degree angle. Use the guiding hand to keep an even pressure on the blade.

2. Start to draw the knife over the stone. Press very gently on the blade. Keep the motion smooth, using even light pressure. Draw the knife across the stone all the way to the heel of the blade. Make light, even strokes, the same number on both sides of the blade. Sharpen in one direction only to get a regular uniform edge. Finish with a few strokes on the steel, then wipe the blade clean.

Grinding wheels, electric sharpeners, and other

grinding tools may be necessary to replace or restore the edge of a badly dull knife.

STEELS

A steel should be used both immediately after sharpening the blade with a stone and also between sharpening to keep the edges in alignment. The length of the steels working surface can range from 3 inches for a pocket version to over 14 inches. Hard steel is the traditional material for steels. Other materials such as glass, ceramic, and diamond impregnated surfaces are also available.

Steels come with coarse, medium and fine grains and some are magnetic, which helps the blade retain proper alignment and also collects metal shavings. A guard or hilt between the steel and the handle protects the user, and a ring on the bottom of the handle can be used to hang the steel.

When using a steel, the knife is held almost vertically with the blade at a 20 degree angle, resting on the inner side of the steel. The blade should be drawn along the entire length of the steel.

USING A STEEL

1. Hold the steel and knife away from your body. With the knife in a vertical position, and at a 20 degree angle to

the steel, touch the steel with the heel of the blade.

2. Pass the knife lightly along the steel, bringing the blade down in a smooth arc.
3. Complete the movement. Do not strike the guard of the steel with the tip of the blade.
4. Repeat the motion on the other side of the steel.

THE GRIP

A proper grip gives you maximum control over the knife. It increases your cutting accuracy and speed, it prevents slipping, and it lessens the chance of an accident. The type of grip you use depends on the job you are doing and the size of the knife.

The grip is one most frequently used for general cutting and slicing. Many chefs feel that actually grasping the blade with the thumb and fore finger in this manner gives them greater control.

Holding the knife may feel awkward at first, but practice will make it seem natural.

THE GUIDING HAND

While one hand controls the knife, the other hand controls the product being cut. Proper positioning of the hand will do three things.

1. Hold the item being cut.
2. Guide the knife. The knife blade slides against the fingers. The position of the hand controls the cut.
3. Protect the hand from cuts. Fingertips are curled under out of the way of the blade.

GUIDELINES FOR DEEP FRYING

1. Fry at proper temperatures. Most foods are fried at 350 degrees to 375 degrees F. Excessive greasiness in fried foods is usually caused by frying at too low a temperature.
2. Don't overload the baskets. Doing so lowers the fat temperature.
3. Use good quality fat. The best fat for frying has a high smoke point, the temperature at which the fat begins to smoke and break down rapidly.
4. Replace about 15 to 20 % of the fat with fresh after each daily use. This extends frying life.
5. Discard spent fat. Old fat loses frying ability, browns excessively, and imparts off flavors.
6. Avoid frying strong and mild flavored foods in the same fat, if possible. French fries should not taste like fried fish.

7. Fry as close to serving time as possible. Do not leave food in the baskets above the fry kettle, and do not hold under heat lamps for more than a few minutes. The foods moisture quickly makes the breading or coating soggy.

8. Protect fat from its enemies:

* Heat: turn fryer off or to a lower holding temp 200 - 250 degrees F when not in use.

* Oxygen: keep fat covered between services, and try to aerate the fat as little as possible when filtering.

* Water: remove excess moisture from foods before frying. Dry baskets and kettle thoroughly after cleaning.

* Salt: never salt foods over the fat.

* Food Particles: Shake loose crumbs off breading items before placing over fat. Skim and strain fat frequently.

* Detergent: rinse baskets and kettle well after cleaning.

Most foods to be deep fried with the major exception of potatoes, are first given a protective coating of breading or batter. This coating gives four purposes.

1. It helps retain moisture and flavor in the product.

2. It protects the fat against the moisture and salt in the food, which speeds deterioration of frying fat.
3. It protects the food from absorbing too much fat.
4. It gives crispness, flavor, and good appearance to the product.

BREADING

Breading means coating a product with bread crumbs or meal before deep frying, pan frying or sautéing. The most widely used method for applying these coatings is called the standard breading procedure.

Flour: helps the egg adhere to the product.

Egg Wash: a mixture of eggs and liquid usually milk or water, give greater binding power, but increases the cost. It helps hold the breading on. A small quantity of oil is occasionally added to the egg wash.

Crumbs: combine with the egg wash to create a crisp golden coating when fried. Fine dry bread crumbs are most often used and give good results. Other products used are fresh bread crumbs. Crusted corn flakes or other cracker meal and corn meal.

- * Dry the product to get a thin, even coating of flour.

- * Season the product or season the flour for greater efficiency. Do not season the crumbs. The presence of salt in contact with the frying fat helps break down the fat and shorten its life.

- * Dip the product in flour to coat completely. Let excess shake off so that crumb coating will be even.

- * Dip in egg wash to coat completely. Let excess drip off so that crumb coating will be even.

- * Dip in bread crumbs. Cover with crumbs and press gently on product. Make sure it is coated completely. Remove, carefully shake off excess.

- * Fry immediately, or hold for service.

- * To hold for later service, place in a single layer on a pan or rack and refrigerate. Do not hold very moist items such as raw clams or oysters. The breading will quickly become soggy.

For small items like scallops and oysters, breading may be done with the aid of a series of wire baskets. Place in the flour, egg wash, and crumbs, instead of by hand. The procedure is the same, except that the baskets are used to lift and shake quantities of the product and to transfer them to the next basket.

To keep one hand dry during breading, use your right hand only for handling the flour and crumbs. Use your left hand for handling the product and the egg wash.

The purpose of dredging is to give a thin, even coating of flour to a product. Meats to be sautéed or pan fried are often dredged with flour to give them an even brown color and to prevent sticking.

Vegetables such as sticks of zucchini are sometimes coated only in flour before deep frying to give them a light golden color and very thin coating.

Batters are semi liquid mixtures containing flour or other starches. They are used in deep frying to give a crisp, flavorful coating. There are many different formulas and variations for batters.

1. Many different liquids are used, including milk, water, or beer.
2. Eggs may or may not be used.
3. Thicker batters make thicker coatings. Too thick a batter will make a heavy, unpalatable coating. Four leavenings are frequently used to give a lighter product. Such as baking powder, baking soda, beaten egg whites, or carbonation from the beer or seltzer.

DEEP FAT FRYING WITH BREADING

1. The main item is cleaned, cut to size and patted dry.
2. Seasoning are applied
3. The item is coated lightly with flour, the dipped in an egg wash, and finally dredged through breading.
4. Items are placed in a wire basket and lowered into the hot fat, which should be about 350 degrees.
5. Turning items during frying is recommended.
6. When golden brown, the items are removed and placed on absorbent toweling to dry. If salting is needed, it must be done away from the deep fat fryer
7. Serve immediately.

METHOD FOR PAN FRYING VEAL

First season the veal and apply light, even coating of flour. This enables the egg wash to hold to the item. The egg wash is comprised of whole eggs combined with milk, cream or water. When the item is coated, the flour and eggs will form a paste to which the breading will adhere. The veal is then coated by dredging through bread crumbs. Breading can be done up to an hour before actual cooking

time, but care must be taken not to damage the coating, which may interfere with the proper sealing of the outer surface.

Pan frying uses a layer of fat placed in an uncovered pan over moderate heat. The fat layer, in this case clarified butter, varies in depth with the type of food being cooked. The fat provides uniform contact with the heat source, prevents sticking, and adds flavor. To check for the proper temperature of the fat, touch the corner of the veal to the fat and observe the frying intensity. Then lower the item into the pan, being careful not to splatter the hot fat. The items are placed in a single, evenly spaced layer in the pan with approximately 1/2 inch between each piece. Overcrowding can cause the temperature to drop too quickly and the items will be unable to form a good seal.

Once frying, the heat is reduced to a moderate flame. The veal is fried on one side until the breading is browned. The item is then turned once and cooked to the final degree of doneness. It is suggested that you keep the items in motion to avoid sticking and insure uniform heat distribution. A layer of fat is maintained between the pan and the product. A properly pan fried item should have a slight amount of “give” when pressed with a finger tip. A golden color and flaky crust is essential. Once cooked, the veal should be briefly drained on absorbent toweling before serving. The item should then be served immediately. Always serve items on warmed plated to avoid rapid heat loss.

METHOD FOR PAN FRYING CHICKEN

For pan frying chicken breasts, use the standard breading procedure; season flour, egg wash, and bread crumbs. Aside from the standard breading, there are a variety of coating options, depending on the desired taste of the final product, such as cornmeal, which may be used in combination with other products, such as chopped nuts or coconut. Specialty flours, such as rye or wheat flours, may also be substituted. The pan used in this method of frying must be able to withstand prolonged heat, transfer that heat evenly, and also be of an appropriate size to insure proper ration of fat to the cooking item. Touch the corner of the chicken to the fat to determine if it has reached the proper temperature. Be sure that the cooking medium has reached the correct temperature before introducing any items into the pan. Use caution when working with hot fats.

When initial browning of the outer surface has taken place, lower the flame to moderate temperature. The item can then be turned to continue even cooking. Keeping the items in motion will maintain a layer of fat between the pan and the item and will prevent sticking. A saucier with its straight walls, a cast iron skillet or griddle is recommended for their safe handling of hot fats.

An important element influencing the final flavor of a fried food is the type of fat used. It should be of neutral

flavor and that it does not interfere with the flavor of the food.

The item may be turned a second time to insure even cooking throughout. The chicken is then removed to drain briefly on absorbent toweling and served immediately.

METHOD FOR FRYING PORK CHOPS

The preferred method of frying pork chops involves seasoning and flour only. The item should be patted dry of excess moisture. Once seasoned the pork chop is coated with a light, even layer of flour. Special care should be taken not to place the items on top of each other or let them touch, which may cause them to stick together before cooking. Determining the proper temperature of the fat can also be accomplished by waiting for a slight shimmer or faint haze will appear. Evenly spaced the items in the pan and avoid over crowding which will lower the temperature of the fat. The item will not be properly sealed at this lower temperature resulting in a soggy, greasy product.

After initial browning, the pork chops are turned once. When using the same pan for multiple frying of chop there must be caution taken to maintain its quality. Straining occasionally helps to prevent black specks from clinging to the item.

When the fat foams or smokes excessively it must be discarded. Drained fat must be placed in a safe container able to withstand the heat and ample space to hold the fat. Larger items such as pork chops are finished in the oven to insure doneness without over browning the outside. Doneness should be checked by touch. The item is then served immediately.

SANITATION

Sanitation is the preparation and distribution of food in a clean environment by healthy food workers. The purpose of teaching sanitation is to attempt to assure that the customer will be protected from food borne illness. In addition to damaging a business's good name, an outbreak of illness can be expensive. Possible legal costs combined with loss of revenue may well force an establishment to close.

Federal, state, and local government regulation work to endure the wholesomeness of the food that reaches the public. Any new food service business should contact the local health department well in advance of opening to ascertain the necessary legal requirements. A professional chef moving to a new area to work should contact local authorities for ordinances specific to that area.

Some states and local jurisdictions offer sanitation certifications programs. Regulation and testing vary from area to area; in some cases, each kitchen is required to have at least one worker who has been certified. Certification is often available through certain academic institutions.

Food can serve as the potential carrier for many different illnesses. The severity of the illness depends on the amount of contamination food ingested and, to a great extent, on the individual's susceptibility, children, the elderly, and anyone whose immune system is already under siege generally will have much more difficulty than a healthy adult in combating a food borne illness.

The most common symptoms of food borne illness include cramps, nausea, vomiting, and diarrhea, possibly accompanied by a fever. These symptoms may appear within a matter of hours, although in some cases, one to two days may elapse before onset. In order for a food borne illness to be officially declared an outbreak, it must involve two or more people who have eaten the same food and must be confirmed by health officials

The source of the contamination affecting the food supply can be chemical, physical, or biological. Insecticides and cleaning compounds are examples of chemical contamination's that may accidentally find their way into foods.

Physical contamination include such things as bits of glass, rodent hairs, and paint chips. Careless food handling can mean that even an earring or a plastic bandage could fall into the food and result in illness or injury.

Biological sources account for the majority of food borne illnesses. These include naturally occurring poisons,

known as toxins, found in certain wild mushrooms, rhubarb leaves, green potatoes, and other plants. The predominant biological agents, however, are disease causing microorganisms known as pathogens, which are responsible for up to 95% of all food borne illnesses. Microorganisms of many kinds are present virtually everywhere, and most are helpful if not essential; it is only a small percentage of microorganisms that are actually responsible for causing illness.

Microorganisms require three basic conditions for growth: a protein source, readily available moisture, and a moderate pH. Many foods provide these three growing conditions, and are therefore considered to be potentially hazardous. Two other factors available oxygen and storage temperature will also affect a microorganism's ability to grow and reproduce but, the requirements for these two factors will vary according to the type of microorganism.

Foods do not necessarily have to be animal based to contain protein; vegetables & grains also contain protein. The higher the amount of protein in a food, the greater its potential as a carrier of a food borne illness. Meats, poultry, seafood, tofu, and dairy products are all categorized as potentially hazardous foods. Sauces such as custards, hollandaise, and mayonnaise are particularly high in egg yolk and should be handled with very careful attention to sanitary work habits at all times.

A food's relative acidity or alkalinity is measured on a scale known as pH. On this scale it shows the effect of pH on bacterial growth. A moderate pH a value between 4.6 and 10 on a scale that ranges from 1 to 14 is best for a bacterial growth, and most foods fall within that range. Salting, brining, or pickling will change a food's pH to a more alkaline measurement of 10 or more; this will mean that the food is no longer as susceptible to food borne illness.

Preserving is a method by which foods are smoked, salted, or air-cured is another way to reduce the potential for bacterial growth. It is for this reason that meats were salted, smoked, or air-cured to preserve them through the winter before refrigeration became widely available.

Food borne illnesses fall into two distinct subdivisions: intoxication's and infection.

Food intoxication occurs when a person consumes food containing toxins produced during the pathogen's life cycle. Once in the body, these toxins act as poison. A staphylococcus intoxication and botulism are food intoxication's.

In the case of an infection, the food eaten by an individual contains large numbers of living pathogens. These pathogens multiply in the body and generally attack the gastrointestinal lining. Salmonellosis is an example of a food borne infection.

The specific types of pathogens responsible for food borne illnesses are fungi, viruses, parasites, and most important, bacteria.

Fungi, which includes molds and yeast, are more adaptable than other microorganisms and have a high tolerance for acidic conditions. They are more often responsible for food spoilage than for food borne illness. Fungi are important to the food industry in the production of cheese.

Viruses do not actually multiply in food, but if food is contaminated by a virus through poor sanitation practice, consumption of that food may result in illness. Infectious hepatitis caused by eating shellfish harvested from polluted waters. A chef should be sure of where the shellfish is coming from and to know that all harvested should be tagged.

Viruses reproduce a sexually. This process, known as bacteriophagins, occurs when a virus invades a cell and reprograms it to produce more of the viruses and leave behind the dead cell and invades even more cells.

Parasites are pathogens that feed and take shelter from another organism. Different parasites reproduce in different ways. Once consumed, the life cycle and reproduction cycle continue. When the larvae reach adult

stage, the fertilized female release more larvae, which travel to the muscle tissue and the cycle continues.

Bacteria are responsible for the majority of biologically caused food borne illness. It is important to understand the classifications and patterns of bacterial growth in order to better protect food during storage, preparation, and service.

Foods that contains pathogens in great enough numbers to cause illness may still look and smell normal. Disease causing microorganisms are too small to be seen with the naked eye, so it is usually impossible to ascertain visually that food is unfit for human consumption. Although cooking food will destroy many of the microorganisms present, careless food handling after cooking can reintroduce pathogens that grow even more quickly with out competition for food and space from spoilage microorganisms.

Although shortcuts and carelessness do not always result in food borne illness, inattention to detail increases risk of creating an out break that may cause service illness or even death.

The various kinds of expenses that a restaurant can incur as the result of an outbreak of food borne illness can be staggering. In addition, negative publicity and loss of

prestige are blows from which many restaurants can simply never recover.

Many food borne illnesses are a result of unsanitary handling procedures in the kitchen. Cross contamination occurs when disease causing elements are transferred from one contaminated surface to another, and can be avoided by adhering to the following practices.

Excellent personal hygiene is one of the best defenses against cross contamination. The employee who works with a contagious illness or even an infected cut on the hand puts every customer at risk. Anytime the hands come in contact with a possible source of contamination especially the face, hair, eyes, and mouth, they must be thoroughly washed before continuing any work. Food handlers should observe careful hygienic procedures.

Food is usually at greater risk of cross contamination during the preparation stage. Ideally, separate work areas and cutting boards should be used for raw and cooked foods. Equipment and cutting boards should always be cleaned and thoroughly sanitized between uses.

An equally important weapon against pathogens is the observance of strict time/temperature controls. The temperature range in which foods are most susceptible to contamination is 45 to 140 degrees. This range is known as the “danger zone” . Food left in the danger zone for a period longer than 2 hours are considered adulterated. It

also should be understood that the 2 hour does not have to be continuous. It includes every time the food enters the danger zone. Heating and cooling foods outside the danger zone will not reduce the total accumulation.

Cooked foods that are to be stored need to be cooled down to below 45 degrees as quickly as possible. Hot liquids should be placed in a cold water or ice water bath, and stirred frequently so that the warmer liquid at the center mixes with the cooler liquid at the outside edge of the pot, bringing the overall temperature down rapidly. Stirring also discourages potentially dangerous anaerobic bacteria from multiplying at the center of the mixture. Semi solid foods should be refrigerated in shallow containers to allow greater surface exposure to the air for quickly chilling.

When foods are prepared ahead and then reheated, they should move through the danger zone as rapidly as possible and be reheated to a safe internal temperature. Improperly reheated foods are frequently to culprit in food borne illness.

Refrigeration and freezing units should be regularly maintained and equipped with thermometers to make sure that the temperature remains within a safe range. Although in most cases chilling will not kill any pathogens, but it will slow down the reproduction. A refrigerator should be kept between 36-40 degrees, but better quality is achieved if certain foods are stored a certain temperatures such as:

meat & poultry 32-36, fish & shellfish 30-34, eggs 38-40, dairy products 36-40, produce 40-45 degrees.

Storing raw foods below and away from cooked food helps to prevent cross contamination by drippings. All food storage area including dry storage should be organized daily and using the (FIFO) first in, first out method of rotation of products.

It is important to know the distinction between cleaning a surface or object and sanitizing it. Cleaning refers to the removal of soil or food particles, unlike sanitizing involves using moist heat or chemical agents to kill pathogenic microorganisms. All warewashing machines use some kind of sanitation method, either very hot water or chemical agents.

Hard water, which contains an excessive amount of iron, calcium, or magnesium. Will interfere with the effectiveness of detergents and sanitizing agents and may also cause deposits that can clog the machinery. A water softener will prevent these problems.

Avoiding injury and illness to the staff and guests in the responsibility of every employee. Professionals do not take foolish chances with the public health, their reputation or the establishment reputation. A chefs attention to detail will provide the most effective evidence that a rest and its customers are in the hands of a dedicated and responsible professional.

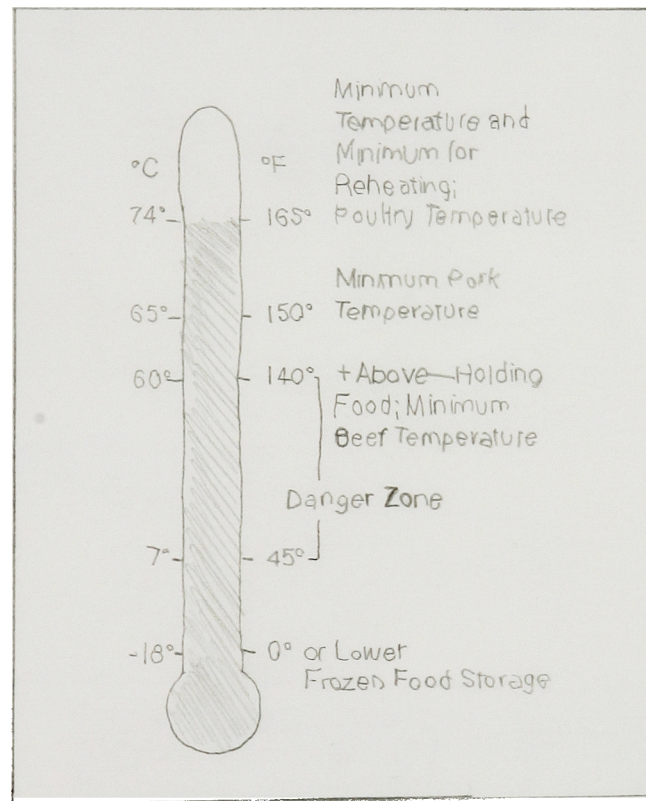
A chefs uniform is an outward symbol of profession. Looking like a professional helps to generate a feeling of professionalism. The uniform history is an interesting one, reflecting both a practical, utilitarian outlook as well as its more romantic aspects.

A chefs checked pants serve to disguise the inevitable spots that develop while working. The white jacket is doubled breasted so that if it becomes soiled during service it can be rebuttoned to hide the dirt. Also, the double layer of fabric provides additional protection from scalds and burns. Finally, the jacket reflects the fact that the term “chef” in this country at least does not denote gender; it is equally appropriate for men or women.

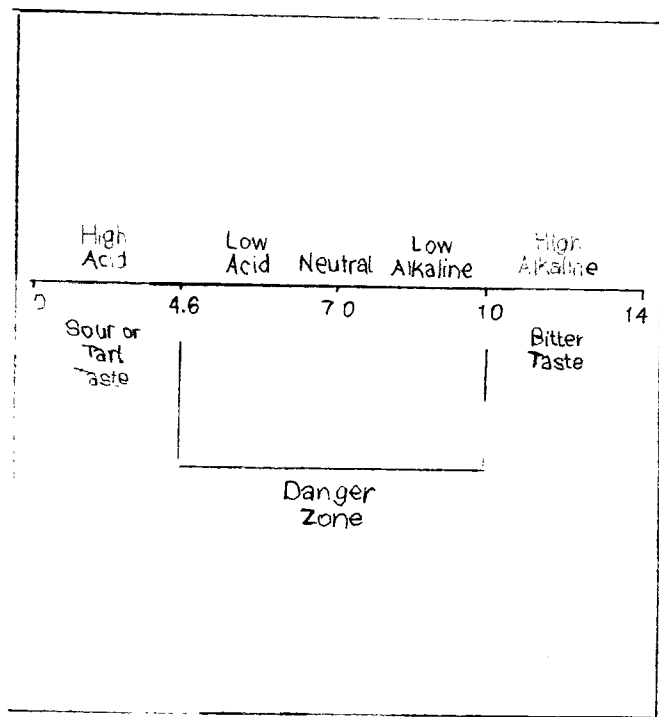
The neckerchief, tied cravat style, originally served to absorb facial perspiration; today; it provides a finished look, much as a tie completes a suit. Aprons protects the uniform from spills and insulate the body from burns and scalds.

The most recognizable part of the uniform is the toque blanche, or hat. There are many explanations for the shape of the hat. For instance, some believe that the tall white hat may have originated at the time the Byzantine empire was under siege by the barbarians. Fleeing persecution, many men (some philosophers, artists, and some chefs to royalty) fled to the Greek Orthodox monasteries for protection. In the monasteries, the head gear they wore was the same as

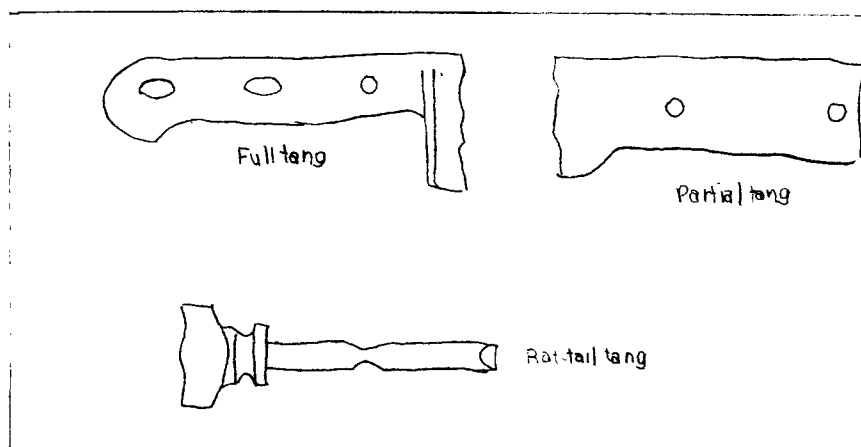
the tall black hats of the priest's uniform so that they would not be recognized. After the threats of persecution lessened, they wore white hats, to differentiate themselves from the ordained priests. The pleats on a chef's hat also have a story the hundred pleats are said to represent the 100 ways a chef can prepare eggs.



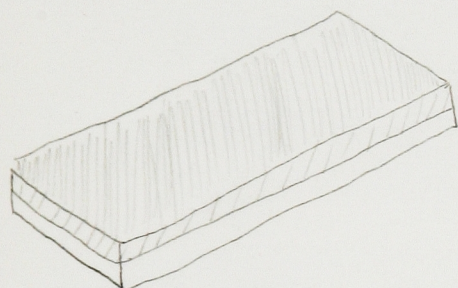
Safe reheating Temperatures for foods.



pH values for various foods.



Tongs: full tang, partial tang, and rat-tail tang.



Sharpening stone

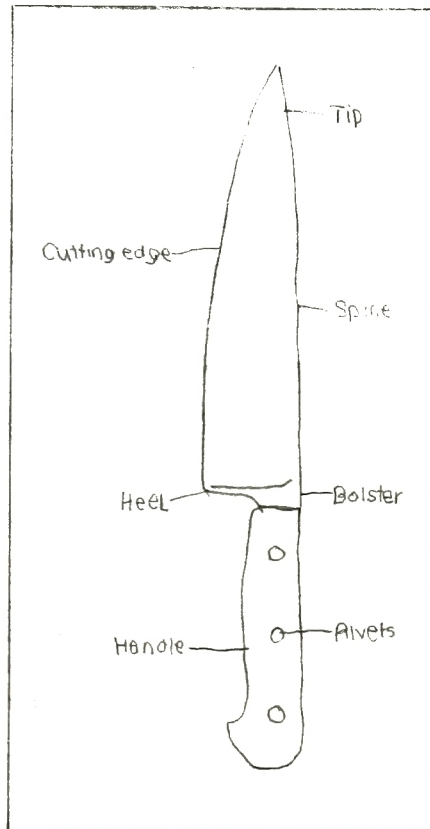


Triple-face stone

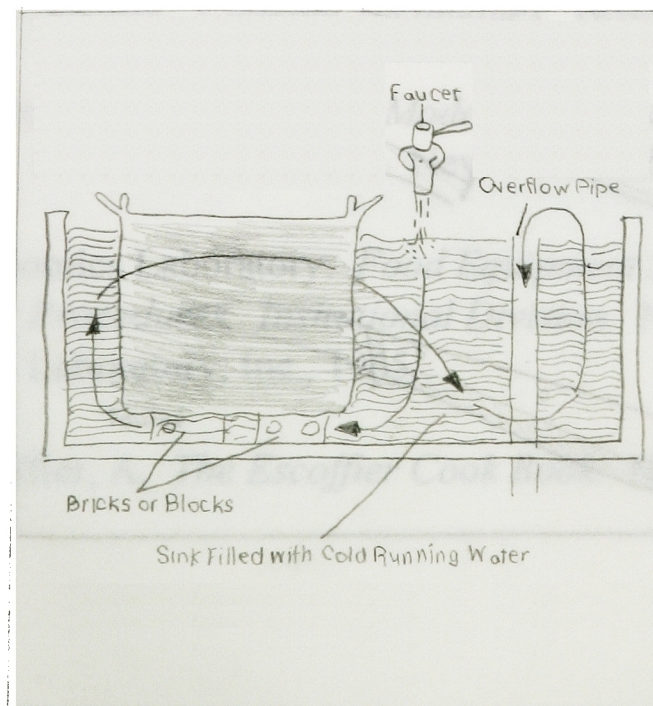


Steel

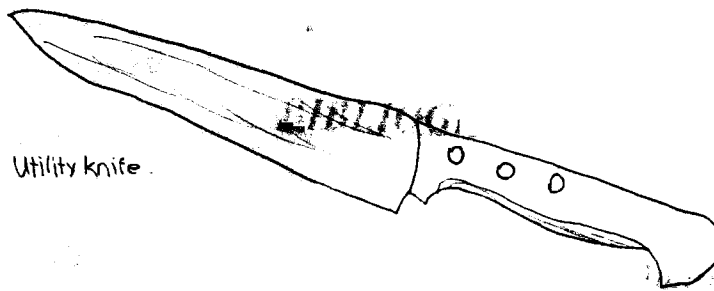
Sharpening stone, triple-face stone, and steel.



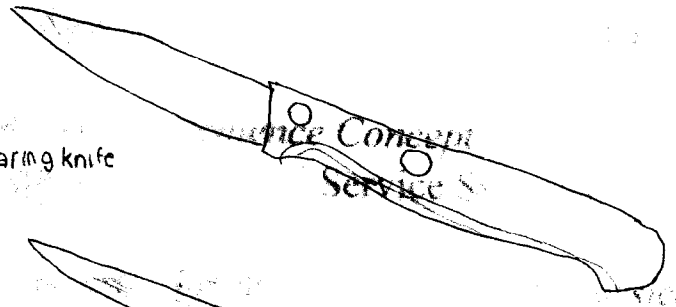
Chef's knife.



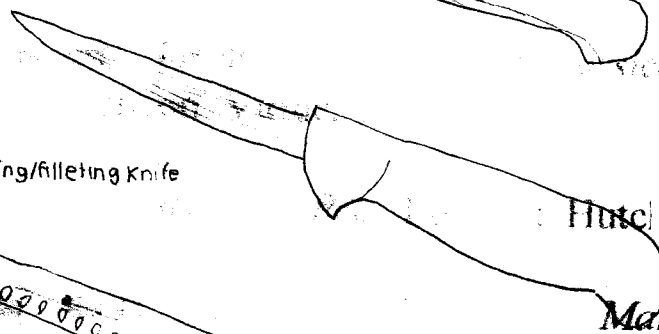
Proper cooling procedure for liquids.



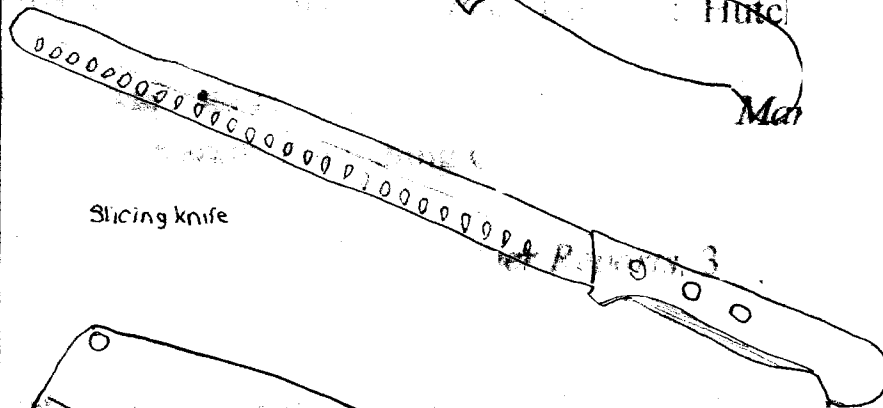
Utility knife



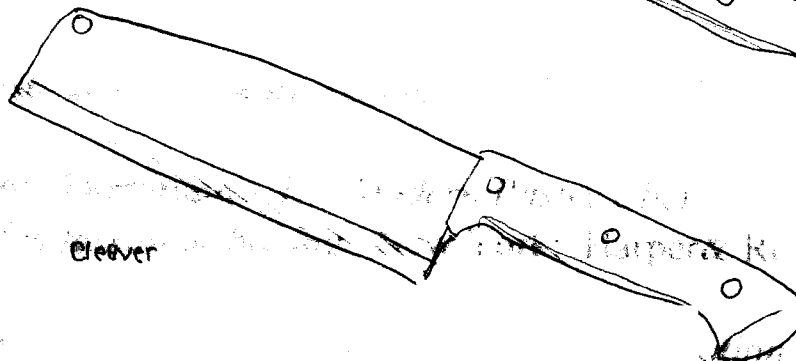
Paring knife



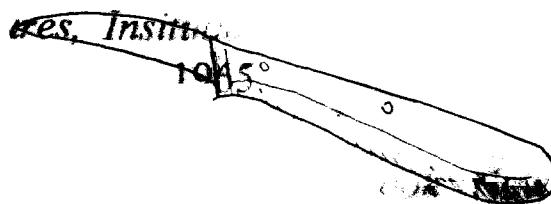
Boning/filleting knife



Slicing knife



Cleaver



Other knives: utility, paring, boning/filleting, slicing, cleaver, and tournet.

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